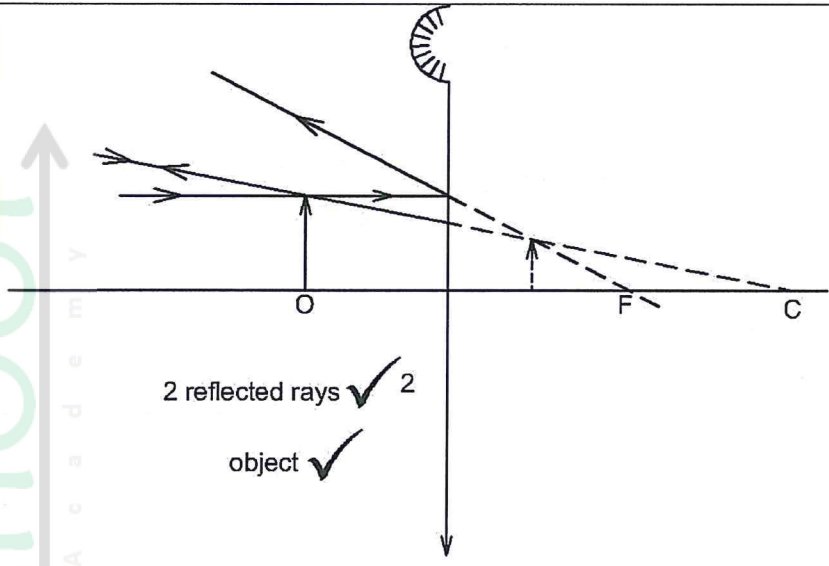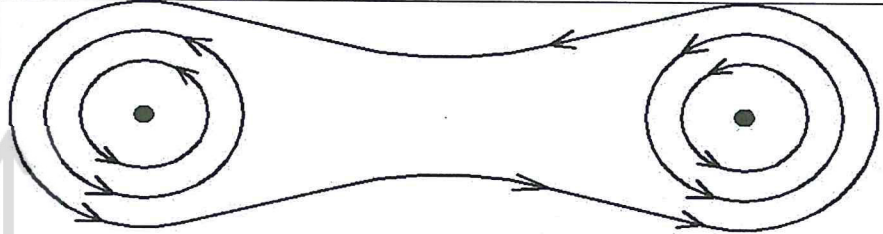## 4.6.2 Physics Paper 2 (232/2)

SECTION A (25 marks)

1.	Sounds produced in the studio are reflected by the walls producing echoes √ in the room; that interfere with the signals transmitted. The woolen materials will absorb the sound hence reduce the echo effects√.	(2 marks)
2.	– Hard x-rays have a higher frequency than soft x-ray. √ – Hard x-rays have more penetrating power than soft x-rays. √ (only one)	(1 mark)
3.	End B is a south pole.	(1 mark)
4.	The image is blurred.	(1 mark)
5.	$\dfrac{Sin\ i}{Sin\ r} = \eta$ √ $\dfrac{Sin30}{Sinx} = 1.36$ $\dfrac{Sin30}{1.36} = Sin\ x$ $x = 21.6^{0}$ √	(2 marks)
6.	$I = \dfrac{P}{V}$ √ $= \dfrac{1800}{240}$ √ $= 7.5A$ Fuse rating of 8A is suitable. √	(3 marks)

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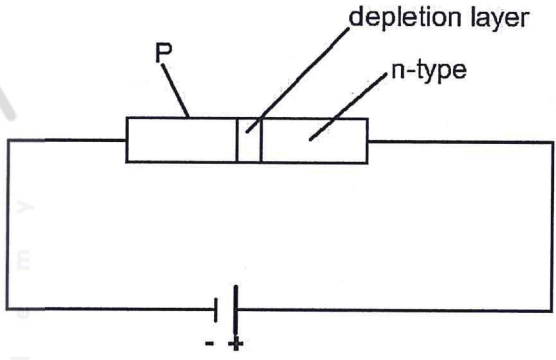| 7.		(3 marks)
	2 reflected rays ✓ 2 object ✓	
8.	Spontaneous disintegration of atomic nuclei by emission of radiations. √	(1 mark)
9.	$\dfrac{V_p}{V_s} = \dfrac{I_s}{I_p} = \dfrac{N_p}{N_s}$ √ $\dfrac{600}{9000} = \dfrac{0.15}{I_p}$ √√ $I_p = 2.25A$	(3 marks)
10.	The leaf collapses √ – Negative charge is induced on the tip of the pin. Pin repels negatively charged √air ions which discharges the electroscope√.	(3 marks)
11.	Gamma, ultraviolet, purple light, infrared. √	(1 mark)
12.	It acts as a depolarizer. √	(1 mark)
13.	A battery is a group of cells connected in series or parallel. √	(1 mark)

| 14. | field around each wire ✓ attraction ✓ Field around each wire attraction. | (2 marks) |

SECTION B (55 Marks)

15.	a)		
	(i)	By use of step-up transformers low input voltages are stepped up to high voltages for transmission. √	(1 mark)
	(ii)	They are cheaper √	(2 marks)
		They are lighter. √/ lower density / lower weight	
	b) Y is the earth wire√, it is connected to the casing of the cooker. √		(2 mark)
	c)		(2 marks)
	(i)	$I = \dfrac{P}{v} = \dfrac{60}{240} = 0.25A$ √	
		No. of bulbs $= \dfrac{5}{0.25} = 20$ √	
	(ii)	Cost = Power x time x rate√	(3 marks)
		$= \dfrac{60}{1000} \times 20 \times 5 \times 20 \text{ x } 3$√	
		= ksh. 360.00√	

16.	a)		
	(i)	The emission of electrons from a metal surface when light/ electromagnetic radiations shine on it. √	(1 mark)
	(ii)	The minimum frequency of radiation required to eject electrons from a metal surface. √	(1 mark)
	b)		(2 marks)
	(i)	Increased intensity increases the number of electrons emitted√ hence a higher current reading on the microammeter. √	
	(ii)	To minimize collisions between electrons and air molecules which would cause loss of energy. √	(1 mark)
	c)ll		(3 marks)
	(i)	$h = \text{slope}$√ $= \dfrac{Vk.e}{Vf}$ $= \dfrac{(3.0-1.0)\times10^{-19}}{(8-5.7)\times10^{14}}$ √ $= 8.69 \times10^{-34}\,\text{Js}$√	
	(ii)	$T_{\circ} = \dfrac{c}{f_{\circ}}$ √ $= \dfrac{3\times10^{8}}{4.6\times10^{14}}$ √√ $= 6.52\times10^{-7}\,m$	(3 marks)

17.	a)		(3 marks)
	(i) No change in frequency√		
	(ii) Wavelength increases√		
	(iii) Velocity increases√		
	b) (i) Image is virtual hence magnification $=-2$ $\dfrac{v}{u}=-2$ $v=-24$√ $\dfrac{1}{f}=\dfrac{1}{v}+\dfrac{1}{u}$ $\dfrac{1}{20}=\dfrac{1}{u}-\dfrac{1}{2u}$ √√ $\dfrac{1}{20}=\dfrac{2-1}{2u}$ $u=10cm$		(3 marks)
	(ii) – a film projector√ -A compound microscope√		(2 marks)
	c) In a camera focusing is done by changing the distance between the lens and the film. √ While in the eye focusing is done by changing the curvature of the lens. √		(2 marks)
	d) – Diverging lens√ Forms a virtual image when the object distance is greater than the focal length. √		(2 marks)

| 18. (a)	(i)		(2 marks)
		depletion layer, P, n-type, 1 mark for polarity ✓, 1 mark for showing depletion layer ✓	
	(ii)	The holes and the electrons in their respective regions are attracted away from the junction by the external voltage.	(1 mark)
	(iii)	The voltage at which the diode begins to conduct in the reverse bias mode.	(1 mark)
	(iv)	- In rectification circuits for changing a.c. to d.c. - In control of voltages of Zener diode. (Any one correct)	(1 mark)
(b)	(i)	$$f = \frac{1}{T}$$ $$= \frac{1}{5 \times 5 \times 10^{-3}}$$ $$= 40 Hz$$	(2 marks)
	(ii)	$$V_\circ = \left(\frac{7}{2}\right) \times 100$$ $$= 350 V$$	(3 marks)
	(iii)	Double the time control to 10ms per division. Adjust the frequency of the source to half the value	(1 mark)

19.	a) (i)	(2 marks)

a) (i)

1 mark for maximum displ.

1 mark for minimum displ.
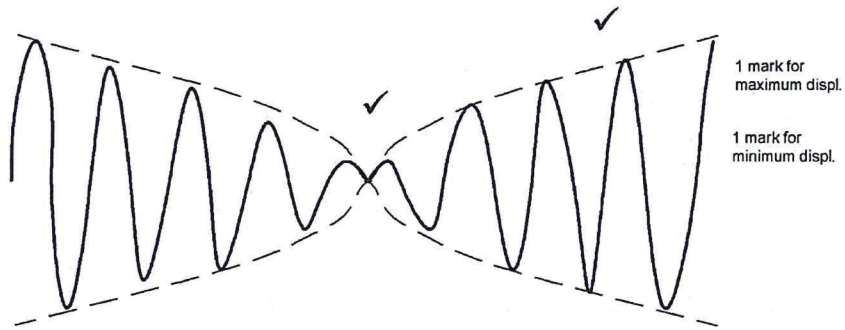
1 mark for maximum displacement

1 mark for minimum displacement

b)	(2 marks)
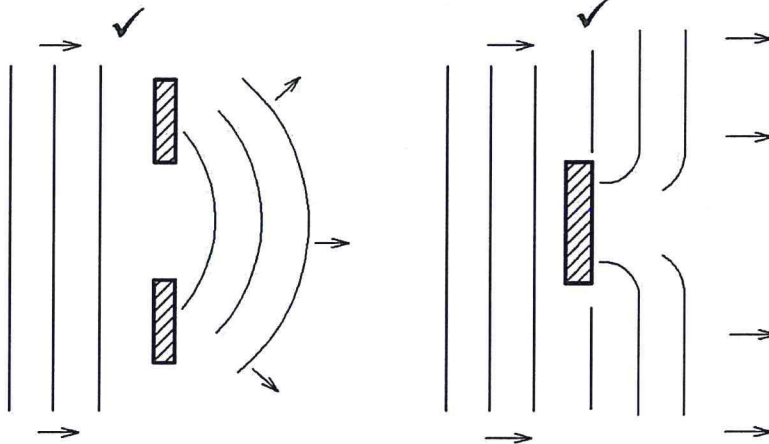
c)	(1 mark)

Any two points A and B in phase

c)
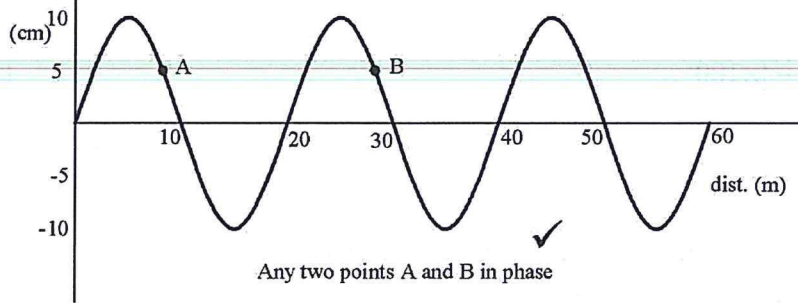
Any two points A and B in phase

	ii) (I) Amplitude = 10cm (II) Wavelength = 20m	(2 marks)
	iii. I $T = \frac{1}{f} = \frac{1}{50} = 0.2s$	(1 mark)

	II $V = fx$
	        $= 20 \times 50$
	        $= 1000\ ms^{-1}$
		(3 marks)